Local empowerment through community mapping for water and sanitation in Dar es Salaam

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SUMMARY: This paper describes a community enumeration and mapping programme in five low-income settlements in Dar es Salaam. The inhabitants documented their settlement and its problems in detail, especially for water and sanitation, with support from the UK charity WaterAid and PEVODE, a Tanzanian NGO. The paper describes the planning and implementation of the enumeration and mapping, the information gathered, and how it was used. It also describes the way in which the process helped establish links between these communities and government agencies, and stimulated local action to address some of the problems identified.

I. INTRODUCTION

THIS PAPER WAS originally part of a larger document written for WaterAid in Tanzania during a three-month staff secondment, the objective of which was to record the processes, methodologies and approaches WaterAid employs in its programmes in the Dodoma Region and in Dar es Salaam. This paper looks at one specific component of these approaches – that of community mapping.

Approximately four weeks were spent with the Dar es Salaam programme for this community-mapping process. Five “Streets”,(1) or settlements, were visited by WaterAid together with partners PEVODE and WAHECO (Box 1). Documents were reviewed and WaterAid Dar es Salaam staff interviewed people on the process of community mapping.

An overview and background to the mapping process is presented in this first section. Section II gives details of the individual stages in the community-mapping process in Dar es Salaam, including preparatory work, fieldwork, and analysis and feedback. Section III discusses the challenges, successes and lessons learned, and the final section consists of reflections on the mapping process.

Box 1: Acronyms used in this paper

| PSP: private sector participation |
| PEVODE: People’s Voice for Development |
| WEPMO: Water Environment Project and Maintenance Organization |
| WAHECO: Water, Health, Community Development and Education Teams |
| DAWASA: Dar es Salaam Water and Sewerage Authority |
a. WaterAid Tanzania

WaterAid’s history in Tanzania goes back to 1984, when it started working in Dodoma under the auspices of the Anglican Church. Between 1989 and 1991, contacts were established with the government’s Water Department and they became WaterAid’s main partner in Dodoma. More recently, WaterAid has expanded its activities to Tabora (1995), Kiteto (1996), Dar es Salaam (1998) and Singida (2001), and has extended its work to include NGOs and the private sector.

b. The Dar es Salaam programme

Dar es Salaam is a city of 3.5 million residents, with a daytime population of around 5 million. For more than ten years, its water supply and sanitation services have been in a perennial state of crisis and, as a result, passions run high in the city whenever this topic is discussed. The privatized city water and sanitation utility, DAWASA (Dar es Salaam Water and Sewerage Authority), currently has about 86,000 customers. The balance of the population obtains its water through informal supplies, often of dubious quality and always at a price well beyond that paid by DAWASA’s middle-class customers.

WaterAid has been working in Temeke Municipality (one of three municipalities which make up Dar es Salaam) since 1998, with the aim of developing methodologies that support community groups in managing their own discrete water supplies. The programme has focused on 11 Streets in three wards in the Temeke Municipal Council area. In the first two years, seven community water supply schemes were constructed, serving an estimated population of 43,000 residents through a network of 50 public standposts. A further two schemes have been added, extending the public standpost network to 72 domestic points. The technology consists of medium-depth boreholes (40–60 metres deep) with electric submersible pumps and an overhead tank serving piped reticulation systems.

A Street social mobilization and institutional development process has resulted in the establishment of water-user committees, who are charged with operating and managing the water schemes. Work has started on hygiene promotion and sanitation improvements in five communities, and activities include “child-to-child” hygiene promotion, the construction of demonstration ecological latrines and Street cleaning-up campaigns.

WaterAid has two main partners in Dar es Salaam: the People’s Voice for Development (PEVODE), an umbrella organization of water-user associations, and WAHECO, a mobilization team made up of approximately eight staff members from the municipal departments for water, health, education and community development. WaterAid also works with DAWASA and a small emerging partner, the Water and Environment Project Maintenance Organization (WEPMO).

c. Background to the community-mapping project

In the second half of 2001, WaterAid undertook research in an attempt to look closely at the changes being considered to resolve Dar es Salaam’s water and sanitation problems. The study examined how poor communities were coping with the continuing water and sanitation crisis, looked at
Box 2: Provision for water and sanitation in Dar es Salaam
(in Mld – million litres per day)

Dar es Salaam has around 3.5 million inhabitants. After 30 years of under-investment and the degradation of its utilities, the problems of water and sanitation provision in Dar es Salaam have now reached crisis proportions.

Only 37 per cent of the water supplied for Dar es Salaam actually reaches customers (including illegal tappers) – see figure below – and only a small proportion of those who receive water actually pay for it; estimates vary between 8 and 16 per cent.

Around half the population is supplied through the piped water system although a large proportion of this is through community kiosks, not house connections. Provision is particularly poor in the 55 unplanned settlements that have grown up alongside road networks and in between housing and business estates, and which house around 80 per cent of Dar es Salaam’s population. A range of informal entrepreneurs supply water to urban poor areas, drawing water from their own taps, neighbours’ taps or the few public sources. In Temeke, one of the three municipalities that make up Dar es Salaam, at least 120,000 out of the estimated 200,000 households remain unconnected to the water system. Nine out of ten households buy water for drinking from vendors or neighbours, and use a variety of other sources for washing and for other water needs. Some 4,000 water vendors operate in Temeke. Sewers serve less than 8 per cent of the city’s population; over 90 per cent of city households rely on pit latrines or toilets connected to septic tanks.

The mechanisms they used in place of the city’s failed public services, and determined what they felt about the impending privatization of the water system. Part of this study involved community mapping in five settlements, or Streets, in the city.

Community mapping is a technique that has been applied successfully in a number of urban communities in Asia and Africa. It can be used in development planning and, more recently, has become a key tool for community mobilization and empowerment.

This participatory process helps to uncover issues particular to a given


settlement that residents are struggling to develop. By collecting information on their settlement, community members come to understand their situation better and can conceptualize a process of change within it.

The objectives of the community-mapping exercise, in addition to collecting data for WaterAid’s private sector participation (PSP) study, were threefold:

- to support PEVODE in developing participatory baseline indicators that could be used in policy debates;
- to build the capacity of local organizations to influence decision-making processes; and
- to use the data collected to establish links between the micro (local) and macro (government) levels.

The mapping exercise was preceded by an exchange visit from representatives from South Africa’s Homeless People’s Federation and Zimbabwe’s Dialogue on Shelter, who participated in the training and the pre-test fieldwork. These groups have long experience in community-mapping work, and their representatives introduced PEVODE and the communities to mapping and enumeration methodologies and to savings schemes.

The approach proved to be a successful tool in empowering these communities. Residents now feel confident enough to engage with authorities in an effort to address the difficulties of their situation. PEVODE has already used some of the findings while advocating in policy discussions at both the municipal and national levels. With the use of hard facts, they are better able to air their views, influence decision-making and feel more confident in contributing to key debates. With the help of WaterAid, PEVODE will produce materials for policy negotiation based on the study’s findings.

WaterAid continues to use the outcomes of the exercise to support partners’ work in water, sanitation and hygiene promotion. The informa-
The information collected is not only relevant to communities but also to national-level government. Clear links can now be made between the micro and macro levels. Findings from the mapping process were also fed into WaterAid’s private sector participation study.

II. THE MAPPING PROJECT

THE COMMUNITY MAPPING took place in the five Streets, or settlements, of Keko Mwanga B, Zamcargo, Tungi, Yombo Kilakala and Kigamboni in Temeke Municipality. These Streets differ greatly in size, and the process took between one week and one month to complete in each settlement. Figure 1 sets out the process.
a. Stage one – preparation

The first stage focused on introducing stakeholders to the community-mapping exercise and planning with them. A series of workshops and seminars informed and prepared all participants in the process, and this was an opportunity to clarify objectives and outcomes.

Planning of community-mapping process. WaterAid held a one-day planning and training session for PEVODE board members, WAHECO and DAWASA staff, WEPMO members and selected community members (from the water-user committees). Topics under discussion included the current state of water and sanitation in the Streets, plans for future development, and possible connections to DAWASA services in light of the privatization of the authority. The concept of community mapping was introduced and discussed as a tool for accessing information to steer development. Particular focus was placed on water and sanitation. Finally, dates for the training of facilitators were agreed and participants confirmed.

PEVODE staff and the community development officer from the WAHECO team then introduced the process at ward level. The community representatives fed back their responses to the Street governments and to water-user committees and health committees. The mapping process was introduced to each Street and work started on identifying the community-mapping teams.

Training of facilitators. A training workshop was held to give the facilitators the tools to train and support community teams in community mapping. Representatives from all the stakeholder groups were included: WaterAid (one), PEVODE (five), DAWASA (one), WAHECO (three), WEPMO (one) and community members (four – two of whom were from the first two Streets to be mapped and were also water-user committee members). Two participants from the government (ward executive officers) were invited but did not attend.

The workshop lasted for four days and covered the following areas:

- private sector participation;
- enumeration and mapping techniques;
- attributes of facilitators;
- development of enumeration forms;
- drawing of community maps;
- practical examples of how to facilitate the community-mapping process; and
- development of an action plan for the first two Streets to be mapped.

Day 1: On the first day, training focused on introducing the concept of community mapping to the group. It covered the overall aim of the process and guidelines on how to go about planning. In addition, the qualities of a good facilitator were discussed and agreed.

Day 2: At this stage, the enumeration form was introduced. Guidelines on how to prepare a form were discussed, together with its purpose in the mapping process. Discussions on savings, in particular on the sort of questions to ask when extracting this type of information, also took place.

Day 3: The third day was spent on the techniques of drafting a community map. Emphasis was placed on ensuring that participants understood the importance of drawing the map and on its use in the overall process.

A draft version of the enumeration form, used on Day 4, was discussed.

Day 4: The final day involved trying out the methodologies in Keko Mwanga B. Fifteen households were selected and interviewed by the...
participants, using the prepared questionnaire or enumeration form. A small map of the area was then drafted. The day was an opportunity for the facilitation team to introduce themselves to the community and vice-versa. Ten community members observed the activities, which served as a further introduction to the community-mapping process.

Training of community teams. As a first step, the Street government in each settlement asked the water-user committees to identify 25 people (19 in the case of Zamcargo) to work together as community-mapping teams. The teams were made up of people from different groups within the community, e.g. religious groups, water-user committee members, elders, health committee members, women, Street government members and political representatives where applicable. Setting up the teams took an average of two weeks, a key objective being to create within the community a sense of inclusion and ownership of the process. Street leaders were asked to provide a venue for the workshop and agree on a time when the training could take place.

The team of facilitators then held a four-day training session. The objective of the workshop was to train the community teams in the methodologies of community mapping. It followed the same syllabus as the workshop for training facilitators.

As a final step, the facilitators and community teams planned the fieldwork. Teams familiarized themselves with the area and visited some of the families and households. Logistics and resources were agreed between the community, WaterAid and PEVODE. It took two days for a tentative work plan to be put together for each Street.

b. Stage two – fieldwork

The community teams played a key role in this stage of the process. Collecting information from the Streets took between 5 and 30 days, depending on the size of the settlement. The teams mobilized the communities and involved them in data collection and analysis. The process included counting, talking, questioning and observing.

WaterAid and PEVODE assisted the teams by providing materials such as the enumeration forms and by supporting them if any problems arose during the exercise. The facilitation team steered the teams in the right direction and provided a “backstopping” service where necessary. WaterAid was particularly concerned with water and sanitation issues, whereas PEVODE noted all the issues that arose. A full Street meeting was held to initiate the process.

The fieldwork was carried out in three steps:
• gathering information from each household by using enumeration forms;
• consolidating these data together with local knowledge of the area in a community map; and
• cross-checking the map by carrying out a transect walk.

Each day, the facilitators and community teams reviewed the tentative plan that had been agreed in stage one, and adjusted the work accordingly.

Enumeration form. The enumeration forms were the teams’ main tool for gathering information from the Streets. They are a key source of information on the issues affecting the community.

The form was developed by the facilitators and community teams during the planning stage, and was designed to include the information on water and sanitation necessary for WaterAid’s PSP study.
The data collected in the forms fall into seven broad categories:

- household information;
- employment and income;
- water and sanitation facilities;
- savings;
- health status;
- educational level; and
- land deeds.

More than half of the time spent on the mapping exercise was used to complete these forms. Each house in the Street was visited by a team member. Sometimes there were many households living in one house, and time was spent with each household completing a form. In the case of Keko Mwanga B, a team member visited four or five houses a day on average. Approximately 125 houses in total were visited daily.

**Map.** Most of the information gathered in the enumeration forms was then consolidated into a map of the Street. The purpose of the map was to capture visually the current situation of a Street. Whereas the enumeration form uncovered a household’s economic situation, the map revealed the physical structures and resources in a given area. Creating the maps helped the teams to gain a better understanding of the key issues their community faced. While drafting the map, the community group was able collectively to conceptualize problems and possible solutions. Map 1 shows a section of the Keko Mwanga B community map.
The community teams spent between 2 and 14 days drafting maps, based on the information they had collected in the enumeration forms, on their personal knowledge of the area and from discussions arising out of the mapping process so far. Some of the information in the maps included:

- location of permanent or temporary latrines;
- location of water sources;
- layout of houses and lanes;
- boundaries;
- drainage systems;
- status of land (permanent or temporary residence);
- small businesses such as shops, salons, bars, tailors, etc.; and
- infrastructure such as schools, health clinics, etc.

Discussions among team members revealed exact locations and issues particular to the area they lived in. Some discussions also revealed ideas for future planning of the area. Many versions of the map were created before a final draft was completed. At this stage, the facilitators took on an advisory role. They had the technical experience of mapping and the community had the knowledge and experience of the area.

**Transect walk.** Once the contents of the map were agreed, the teams undertook a transect walk. The aim of the exercise was to cross-check the accuracy of the map. Details that were still unclear were confirmed and those which were not apparent before the walk were added. WaterAid, PEVODE and WAHECO staff also took part in the walk. It was an opportunity for further discussion within the group and the community on the main issues arising from the exercise.

Once the teams had finally agreed all the details on the maps, an artist was commissioned to create final versions (Map 1). WaterAid, PEVODE and the community teams each kept a copy.

c. **Stage three – analysis and feedback**

The final stage of the mapping process was the analysis and feedback of the information collected during the fieldwork. The community and WaterAid explored the data, and PEVODE ensured that the information was disseminated to the communities. Findings were fed into future mapping processes, policy and advocacy work.

PEVODE held a one-day workshop for the stakeholder group to present the findings of the study and to gather comments on these findings. In addition to the workshop, PEVODE has started documentation and dissemination activities. Fliers and leaflets will be produced, for example, and a report has already been published.

Although findings from the community mapping were documented in all five settlements, there was only limited time for analysis. Specific findings on PSP were analyzed only for Keko Mwanga B and Zamcargo, and analysis for the other settlements is currently underway.

**Community.** Every day during the fieldwork, the community teams examined the data collected in the enumeration forms. This was usually done by listing the questions and data on flip charts, and highlighting the key issues that emerged. These included population numbers, layout and area boundaries, diseases and water sources. Daily analysis also informed the planning of the exercise and clarified whether additional resources and/or support were needed. Once the mapping exercise was completed, the community teams discussed findings and prioritized key issues to be addressed.
The maps were used to follow up and substantiate cases made to local government. In the case of Keko Mwanga B, where the lack of clean, safe water was a major priority, the Street government approached DAWASA and WaterAid for assistance, and succeeded in negotiating with DAWASA to carry out an hydro-geological survey.

In Zamcargo, the health committee was asked to give the community some feedback on the findings. This was done as part of the committee’s regular house-to-house visits, and focused mainly on sanitation issues, i.e. latrine use and refuse disposal.

The community-mapping teams still meet today and are actively involved in mobilizing the community for new projects. Both Zamcargo and Keko Mwanga B have organized sanitation campaigns, which include better refuse disposal systems such as regular rubbish collection and household refuse recycling.5

**WaterAid.** WaterAid is working on analyzing the data particular to water and sanitation. Due to the breadth of information gathered, there is also potential for WaterAid, through its policy office, to influence and advocate for some of the broader issues that were raised during mapping.

Information from the enumeration forms will be fed into a data system for further analysis. The maps can be used for evaluation purposes, particularly in relation to monitoring change within the Streets.

In addition, Loughborough University is currently undertaking a study on the social marketing of sanitation, and will use the data from the enumeration forms to inform this research.

**Dissemination and advocacy.** PEVODE has already taken the issues raised during community mapping forward at policy discussions, at both the municipal and national levels. They are also planning a dissemination campaign to government, and have established a team, together with other community groups, charged with advocating and disseminating the results of the community-mapping exercise.

Two workshops took place to popularize the study’s findings. In addition to participants from national government level, international NGOs, water-user groups and the press were also present. It was an opportunity to disseminate the mapping process to a wider audience.

One of the findings which emerged clearly during the community-mapping process concerned the potential benefits of private sector participation (PSP) for the urban poor. It was decided that instead of PEVODE themselves taking forward the findings to a higher level, it might be a good idea to form a PSP coordination team which would be composed of PEVODE and members from other NGOs such as CONCERN and the CBO, MBADECO. The aim was to give greater credibility to PEVODE, as other players in the forum represented experiences of communities outside of Temeke Municipality. As a result of the workshops, a PSP coordination team was formed and charged with taking forward discussions on PSP.

Figure 2 shows how the community-mapping process influenced planning and created linkages between the community (micro) and government (macro) levels. Whereas the government and WAHECO plan upwards or vertically, PEVODE plans horizontally. The information from community mapping helps to link the two planning processes, in that the findings, gathered in a participatory way, feed into the vertical planning process through WAHECO. PEVODE can influence macro planning by using the communities’ messages (horizontal planning) and linking through WAHECO into the government system.

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5. For example, waste paper is now collected on a regular basis and burnt.
III. SUCCESSES, CHALLENGES AND LESSONS LEARNED

a. Successes

- THE EXCHANGES WITH the South African Homeless People’s Federation and Zimbabwe’s Dialogue on Shelter facilitated the sharing of mapping techniques and introduced communities to the potential of saving schemes in relation to poverty reduction.
- The mapping process successfully mobilized the communities to collect and analyze data particular to their area. Communities are more knowledgeable about their situation, and are empowered to challenge and find solutions to the issues they face.
- Service providers such as DAWASA are more open to the voices of the poor, and there is interest among investors and lenders to discuss options with the communities. Negotiations with DAWASA in Keko Mwanga B have led to a bulk water supply. DAWASA agreed to set up a large connection from which, with the help of WaterAid, PEVODE, WAHECO and local craftsmen (fundis), the community will construct ten water points, a tank and a distribution system. In Keko Mwanga B, the study’s findings
ensured that DAWASA carried out a hydro-geological survey of the area.
• In Zamcargo, a weekly refuse collection has been organized as a result of the work, and now there is also less refuse production and more recycling. Other improvements cited by community members in Zamcargo include the absence of cholera or excreta-related diseases; some houses now enjoying private connections; having money in their accounts for future plans; the community being better integrated due to the seminars and workshops taking place; their Street and its problems being “advertised” to the outside world; and drainage systems being constructed in an “orderly fashion”.
• The community-mapping approach worked well with local government reform, which emphasizes community involvement in planning. Community issues are now included in government planning processes. WAHECO staff are recognized for the approach they have adopted with communities, and the information they have accessed is used for planning at a ward level. Planning for future projects funded by the Tanzania Social Action Fund (TASAF) will follow the same approach.
• The data collected can be used to contribute to current debates on the Poverty Reduction Strategy Paper (PRSP). It is clear that the provision of water and sanitation can help to reduce poverty. Data from community mapping can be used to set the PRSP poverty index in a more realistic way. The community maps are a visual aid showing current poverty levels in the city.
• Using the media to popularize the findings has proven to be very effective, and an article appeared in The Guardian (Tanzania) on 10 September 2002. NGOs from other regions of the country contacted WaterAid after reading the PSP report, and are keen to learn more about community mapping.

b. Challenges

• Some community members were unwilling to take part in the exercise. They felt that there was no need for them to be interviewed, as the enumerators were community members who were already aware of the Street’s issues.
• Others complained that they had been interviewed several times before but had not seen any changes.
• Again, others were worried that the exercise was a tool for the city to plan the demolishing of unplanned settlements.
• It was difficult to get key decision makers to attend the feedback workshops. More dissemination is needed.
• Policy makers are not used to involving communities in their processes, and communities are not practised in working with policy makers.
• The issues uncovered were wide ranging. In Keko Mwanga B, for instance, they included the lack of latrines, drainage systems, roads, solid waste management, health centres, unsafe shallow water sources, land ownership and a neighbouring canal overflowing with chemical waste. The challenge now is how can these be addressed in a holistic way.

c. Lessons

• The community proved to be an essential resource when creating a map.
• The process revealed that many people in Dar es Salaam live in unplanned settlements, and that a more holistic approach should be...
considered in order to tackle all of the issues arising from community mapping. Problems with water and sanitation do not stand alone. Community mapping is an “eye opener” to the wider issues affecting a community.

• The mapping exercise highlighted the fact that sufficient support mechanisms need to be in place. The process uncovered many issues other than those relating directly to water and sanitation. Communities now feel empowered to demand support for these issues, and WaterAid is struggling to link communities to other organizations which can support them.
• There is little awareness among communities of the privatization of Dar es Salaam’s water utility. The PSP coordination forum recommended that organizations such as PEVODE should spearhead the awareness-raising campaign to the community.
• The research validated and refined the argument that the poor will not be affected by the privatization of water and sanitation services. Even if the poor are at present marginal to the process, they cannot afford to remain so.
• PSP is not only an issue for communities in Temeke Municipality. The information from community mapping has revealed that other areas of the city, such as middle-income and other low-income settlements, will also be affected by privatization. Issues of privatization do not apply only to the five settlements mapped during this exercise.
• The networking of stakeholders can amplify their voice. The PSP coordination forum, initiated by PEVODE, is now taking forward with DAWASA particular issues raised during the mapping exercise.

IV. CONCLUSIONS

COMMUNITY MAPPING HAS helped WaterAid, partners and communities to investigate and solve the issues affecting the poorest areas of Dar es Salaam. Hard facts were gathered and presented to decision makers, and there is now an opportunity for dialogue between the government and the communities. The process helped all those involved to plan work and present problems more clearly.

The community-mapping exercise in Dar es Salaam was a unique approach. It systematically uncovered all the issues affecting the five Streets. Most importantly, however, the process established a link between the communities and the government. DAWASA and the local government have a far better sense of the issues affecting communities, and community members now know who to contact for help and support. Community members feel empowered to take control over their lives.

The community-mapping approach that WaterAid initiated in Dar es Salaam was a valuable experience for all involved, and was particularly beneficial for the settlements that carried out the study. Community members in Keko Mwanga B expressed the view that the process: “...has opened and empowered us to do anything now. It showed us a way.”